

F H W A	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
REGION NO.				
3	MD			

PROJECT DESCRIPTION

I. GENERAL

THIS PROJECT IS LOCATED AT THE INTERSECTION OF US 1 BUSINESS (CONOWINGO RD.) AND MD 23 IN HARFORD COUNTY, MARYLAND AND INVOLVES ROADWAY CONSTRUCTION AND THE CONSTRUCTION OF A NEW SIGNAL THAT IS EFFECTED BY THIS CONSTRUCTION. US 1 BUSINESS (CONOWINGO RD.) IS ASSUMED TO RUN IN A NORTH/SOUTH DIRECTION.

II. INTERSECTION OPERATION

THE PROPOSED TRAFFIC SIGNAL WILL OPERATE IN A NEMA SIX (6) PHASE, FULLY TRAFFIC ACTUATED MODE. THE US 1 BUSINESS APPROACHES WILL OPERATE CONCURRENTLY, WITH EXCLUSIVE/PERMISSIVE LEFT TURN PHASES FOR NORTHBOUND AND SOUTHBOUND TRAFFIC. THE MD 23 APPROACH WILL OPERATE SEPERATELY.

A NEW EIGHT PHASE FULLY TRAFFIC ACTUATED CONTROLLER WITH TWO (2) FOUR CHANNEL RACK MOUNTED LOOP DETECTOR AMPLIFIERS, TELEMETRY MODULE, AND INTERSECTION MONITOR WITH BATTERY BACK UP HOUSED IN A NEMA SIZE SIX (6) BASE MOUNTED CABINET.

III. SPECIAL NOTES

1. THE SIGNAL SHOP WILL BE NOTIFIED TO PERFORM INTERNAL WIRING OF THE CABINET AT US RTE. 1 BUSINESS AND MD 23. ALL CABLE SHALL BE IDENTIFIED AND BROUGHT INTO THE CONTROLLER BY THE CONTRACTOR. THE CONTRACTOR SHALL NOTIFY MR. EDWARD RODENHIZER, SHA SIGNAL SHOP AT (410) 787-7650 SEVENTY-TWO (72) HOURS IN ADVANCE OF THIS WORK.
2. MOT PLATES FOR THIS PROJECT WILL BE AS FOLLOWS: 104.00 TO 104.00-12, 104.02-01, 104.03-01

CONSTRUCTION DETAILS

- (A) INSTALL 27 FOOT STEEL POLE WITH 50 FOOT MAST ARM, TRAFFIC SIGNAL HEADS, SIGNS AND 20 FOOT LIGHTING ARM WITH A 250 WATT HIGH PRESSURE SODIUM VAPOR LUMINAIRE. (NOTE: ONE - 3 INCH SCHEDULE 80, 90 DEGREE PVC CONDUIT BEND AND FOUR - 1 $\frac{3}{4}$ INCH x 90 INCH ANCHOR BOLTS)
- (B) INSTALL 27 FOOT STEEL POLE AND WITH 50 FOOT MAST ARM, TRAFFIC SIGNAL HEADS, SIGNS. (NOTE: ONE - 3 INCH SCHEDULE 80, 90 DEGREE PVC CONDUIT BEND AND FOUR - 1 $\frac{3}{4}$ INCH x 90 INCH ANCHOR BOLTS)
- (C) INSTALL NEMA SIZE SIX (6) PHASE BASE MOUNTED CONTROLLER WITH TELEMETRY
- (D) INSTALL HANDHOLE
- (E) INSTALL MICROLOOP PROBES - 1000 FOOT LEAD-IN
- (F) INSTALL MICROLOOP PROBES - 500 FOOT LEAD-IN
- (G) INSTALL 2" SCHEDULE 80 POLYVINYL CHLORIDE CONDUIT - TRENCHED
- (H) INSTALL 3" SCHEDULE 80 POLYVINYL CHLORIDE CONDUIT - BORED
- (I) INSTALL 6 FOOT X 30 FOOT LOOP DETECTOR IN $\frac{1}{2}$ IN. FLEXIBLE TUBING (3-6-3 TURNS)
- (J) INSTALL 1 INCH LIQUID TIGHT FLEXIBLE NON-METALLIC CONDUIT FOR DETECTOR SLEEVE
- (K) INSTALL 24 INCH WHITE PERMANENT PREFORMED HEAT APPLIED THERMOPLASTIC PAVEMENT MARKING
- (L) INSTALL 1 IN. GALVANIZED CONDUIT FOR DETECTOR SLEEVE
- (M) INSTALL 4 IN. SCHEDULE 80 POLYVINYL CHLORIDE CONDUIT - SLOTTED
- (N) PROPOSED OVERHEAD POWER FEED
- (O) NOT USED
- (P) INSTALL 4" SCHEDULE 80 POLYVINYL CHLORIDE CONDUIT - TRENCHED
- (Q) NOT USED
- (R) INSTALL STEEL POLE CUT AND CAPPED TO 20 FEET, WITH 50 FOOT MAST ARM, SIGNAL HEADS AND SIGNS. (NOTE: ONE - 3 INCH SCHEDULE 80, 90 DEGREE PVC CONDUIT BEND AND FOUR - 1 $\frac{3}{4}$ INCH x 90 INCH ANCHOR BOLTS)
- (S) INSTALL GROUND MOUNT SIGN
- (T) INSTALL STEEL POLE CUT AND CAPPED TO 20 FEET, WITH 60 FOOT MAST ARM, SIGNAL HEADS AND SIGNS. (NOTE: ONE - 3 INCH SCHEDULE 80, 90 DEGREE PVC CONDUIT BEND AND FOUR - 2 INCH x 90 INCH ANCHOR BOLTS)

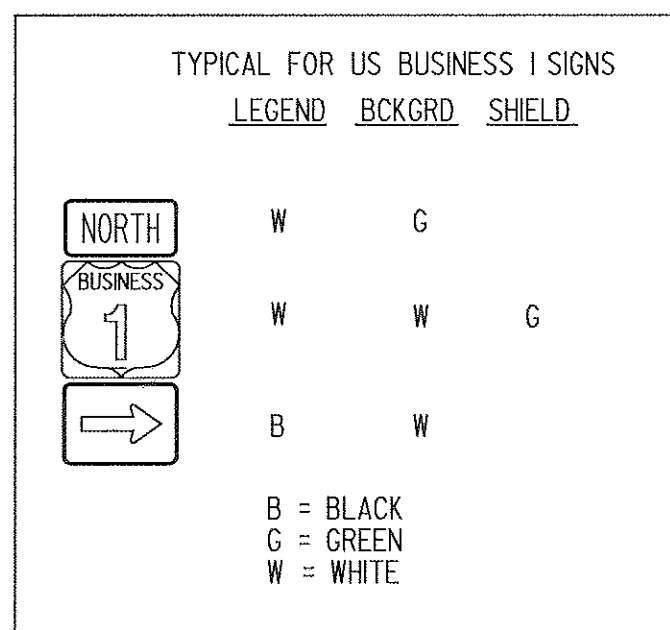
EQUIPMENT LIST

A. EQUIPMENT TO BE SUPPLIED BY SHA AND INSTALLED BY THE CONTRACTOR

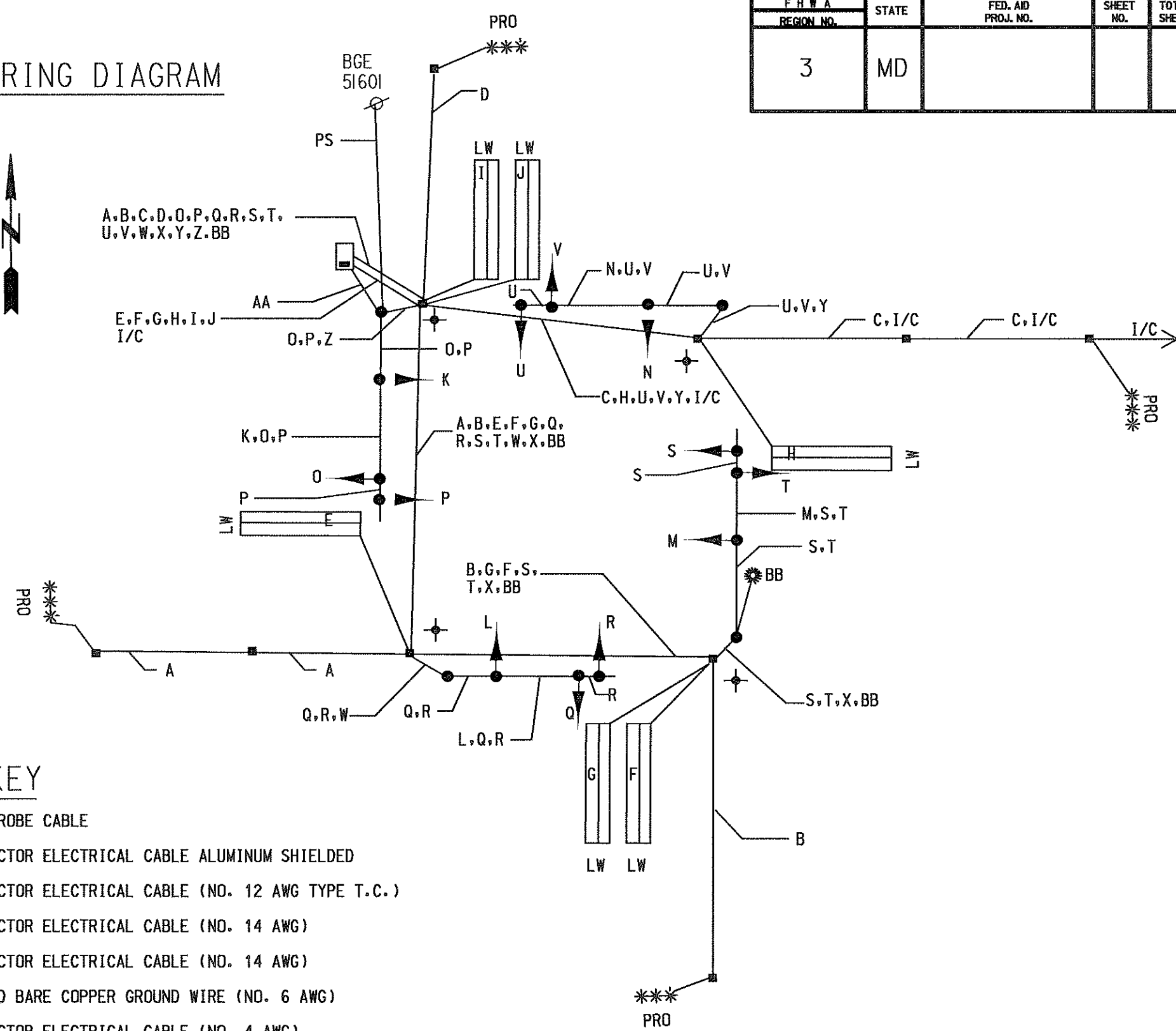
<u>ITEM NO.</u>	<u>CATEGORY CODE NO.</u>	<u>QUANTITY</u>	<u>DESCRIPTION</u>
	900000	1 EA	FURNISH NEMA SIZE 6 BASE MOUNTED CABINET & CONTROLLER WITH TELEMETRY
	900000	4 EA	12" I-WAY, 3-SECTION (R,Y,G) TRAFFIC SIGNAL HEAD - MAST ARM MOUNT
	900000	4 EA	12" I-WAY, 5-SECTION (R,Y,YA,G,G) TRAFFIC SIGNAL HEAD - MAST ARM MOUNT
	900000	4 EA	12" 8" I-WAY, 5-SECTION (R,Y,YA,G,G) TRAFFIC SIGNAL HEAD - MAST ARM MOUNT
	900000	257 SF	SHEET ALUMINUM SIGNS
		- 1 EA.	D3-2 SIGN (16 IN. X 96 IN.) "East/West Hwy" DUAL FACED
		- 1 EA.	D3-2 SIGN (16 IN. X 96 IN.) "Conowingo Rd" DUAL FACED
		- 1 EA.	R3-5R SIGN (30 IN. X 36 IN.) "RIGHT TURN ONLY"
		- 4 EA.	R10-12 SIGN (30 IN. X 36 IN.) "LEFT TURN YIELD ON GREEN"
		- 1 EA.	SHIELD ASSEMBLY "BUSINESS, NORTH, US I, LEFT ARROW" (36 IN. X 75 IN.) - POLE MOUNT
		- 1 EA.	SHIELD ASSEMBLY "BUSINESS, NORTH, US I, RIGHT ARROW" (24 IN. X 51 IN.) - POLE MOUNT
		- 1 EA.	SHIELD ASSEMBLY "BUSINESS, NORTH, US I, RIGHT ARROW" (24 IN. X 51 IN.) - POLE MOUNT
		- 1 EA.	SHIELD ASSEMBLY "BUSINESS, NORTH, US I, LEFT ARROW" (36 IN. X 75 IN.) - POLE MOUNT
		- 1 EA.	SHIELD ASSEMBLY "EAST, MD 23, RIGHT ARROW" (24 IN. X 51 IN.) - POLE MOUNT
		- 1 EA.	SHIELD ASSEMBLY "WEST, MD 23, LEFT ARROW" (36 IN. X 75 IN.) - POLE MOUNT
		- 1 EA.	SHIELD ASSEMBLY "WEST, MD 23, RIGHT ARROW" (24 IN. X 51 IN.) - POLE MOUNT
		- 1 EA.	SHIELD ASSEMBLY "EAST, MD 23, LEFT ARROW" (36 IN. X 75 IN.) - POLE MOUNT
		- 4 EA.	W3-3 SIGN (48 IN. X 48 IN.) WITH "NEW" PANEL (30 IN. X 30 IN.) AND FLAGS - GROUND MOUNT

B. EQUIPMENT TO BE SUPPLIED AND INSTALLED BY THE CONTRACTOR


ITEM NO.	CATEGORY CODE NO.	QUANTITY	DESCRIPTION
	120500	1 L.S.	MAINTENANCE OF TRAFFIC
	203030	3 CY	TEST PIT EXCAVATION
	585445	140 LF	FURNISH AND INSTALL 24" WHITE PERMANENT PREFORMED PAVEMENT MARKING TAPE (STOP BAR)
	801004	14.0 CY	FURNISH AND INSTALL CONCRETE SIGNAL FOUNDATION
	801104	220 LF	FURNISH AND INSTALL WOOD SIGN SUPPORTS (4 IN. X 6 IN.)
	805011	45 LF	FURNISH AND INSTALL 1 IN. ELECTRICAL CONDUIT - GALVANIZED SLEEVE
	805125	1300 LF	FURNISH AND INSTALL 2 IN. SCHEDULE 80 PVC CONDUIT - TRENCHED
	805115	110 LF	FURNISH AND INSTALL 3 IN. SCHEDULE 80 PVC CONDUIT - BORED
	805140	125 LF	FURNISH AND INSTALL 4 IN. SCHEDULE 80 PVC CONDUIT - TRENCHED
	805155	105 LF	FURNISH AND INSTALL 4 IN. SCHEDULE 80 PVC CONDUIT - SLOTTED
	805160	25 LF	FURNISH AND INSTALL 1 IN. LIQUID TIGHT FLEXIBLE NON-METALLIC CONDUIT SLEEVE
	810010	50 LF	FURNISH AND INSTALL ELECTRICAL CABLE 1 CONDUCTOR NO. 4 AWG - THHN/THWN
	811001	10 EA	FURNISH AND INSTALL HANDHOLE
	813014	180 SF	INSTALL GROUND MOUNT SIGN
	813015	85 SF	INSTALL OVERHEAD SIGN
	818036	3 EA	FURNISH AND INSTALL STEEL POLE WITH SINGLE 50 FT. MAST ARM
	818041	1 EA	FURNISH AND INSTALL STEEL POLE WITH SINGLE 60 FT. MAST ARM
	831010	1 EA	FURNISH AND INSTALL 250 WATT HIGH PRESSURE SODIUM LAMP AND LUMINAIRE
	802501	495 LF	FURNISH AND INSTALL STRANDED BARE COPPER GROUND WIRE (NO. 6 AWG)
	837001	4 EA	FURNISH AND INSTALL GROUND ROD 3/4 IN. DIAMETER X 10 FT LENGTH
	838003	1 EA	FURNISH AND INSTALL CONTROL AND DISTRIBUTION EQUIPMENT (120/240V, 1 PH, 3 W)
	860220	12 EA	INSTALL SIGNAL HEAD ANY TYPE- MAST ARM MOUNT
	861116	300 LF	FURNISH AND INSTALL ELECTRICAL CABLE 2 CONDUCTOR NO. 12
	861104	700 LF	FURNISH AND INSTALL ELECTRICAL CABLE 2-CONDUCTOR ALUMINUM SHIELDED
	861105	100 LF	FURNISH AND INSTALL ELECTRICAL CABLE 5-CONDUCTOR NO. 14 AWG
	861107	1575 LF	FURNISH AND INSTALL ELECTRICAL CABLE 7-CONDUCTOR NO. 14 AWG
	862101	2840 LF	FURNISH AND INSTALL LOOP WIRE IN FLEXIBLE TUBING
	862102	900 LF	FURNISH AND INSTALL SAW CUT FOR SIGNAL (LOOP DETECTOR)
	866104	1 EA	FURNISH AND INSTALL 20 FT. LIGHTING ARM ON SIGNAL STRUCTURE
	800000	2 EA	FURNISH AND INSTALL MICROLOOP PROBE SET 500 FT. LEAD IN.
	800000	2 EA	FURNISH AND INSTALL MICROLOOP PROBE SET 1000 FT. LEAD IN
	871202	1 EA	INSTALL NEMA SIZE 6 BASE MOUNTED CABINET
	800000	2 EA	CUT, CLEAN, GALVANIZE AND CAP MAST ARM POLE



WIRING DIAGRAM



WIRING KEY

A-D	MICRO PROBE CABLE
E-J	2 CONDUCTOR ELECTRICAL CABLE ALUMINUM SHIELDED
BB	2 CONDUCTOR ELECTRICAL CABLE (NO. 12 AWG TYPE T.C.)
K-N	5 CONDUCTOR ELECTRICAL CABLE (NO. 14 AWG)
O-V	7 CONDUCTOR ELECTRICAL CABLE (NO. 14 AWG)
W-Z	STRANDED BARE COPPER GROUND WIRE (NO. 6 AWG)
AA	1 CONDUCTOR ELECTRICAL CABLE (NO. 4 AWG)
PRO	MICRO LOOP PROBES
LW	LOOP WIRE
PS	POWER SOURCE
I/C	12 PAIR JELLY FILLED NO. 19 AWG INTERCONNECT CABLE
	GROUND ROD

PHASE CHART

PHASE CHART

	1 	2 	3 	4 	5 	6 	7 	8 	9 	10 	11 	12
PHASE 1 & 5			R			R	R	R	R	R	R	R
PHASE 1 & 5 CHANGE	THE CONTROLLER CAN GO TO PHASE 1 & 6 OR 2 & 5											
PHASE 1 & 6			G	R	R	R	R	R	R	R	R	R
PHASE 1 & 6 CHANGE			G	R	R	R	R	R	R	R	R	R
PHASE 2 & 5	R	R	R			G	R	R	R	R	R	R
PHASE 2 & 5 CHANGE	R	R	R			G	R	R	R	R	R	R
PHASE 2 & 6	G	G	G	G	G	G	R	R	R	R	R	R
PHASE 2 & 6 CHANGE	Y	Y	Y	Y	Y	Y	R	R	R	R	R	R
PHASE 3 & 7	R	R	R	R	R	R			R			R
PHASE 3 & 7 CHANGE	THE CONTROLLER CAN GO TO PHASE 3 & 8 OR 4 & 7											
PHASE 3 & 8	R	R	R	R	R	R			G	R	R	R
PHASE 3 & 8 CHANGE	R	R	R	R	R	R			G	R	R	R
PHASE 4 & 7	R	R	R	R	R	R	R	R	R			G
PHASE 4 & 7 CHANGE	R	R	R	R	R	R	R	R	R			G
PHASE 4 & 8	R	R	R	R	R	R	G	G	G	G	G	G
PHASE 4 & 8 CHANGE	R	R	R	R	R	R	Y	Y	Y	Y	Y	Y
FLASHING OPERATION	FL/Y	FL/Y	FL/Y	FL/Y	FL/Y	FL/Y	FL/R	FL/R	FL/R	FL/R	FL/R	FL/R

THE FOLLOWING CONTACT PERSONS FOR
DISTRICT # 4 ARE AS FOLLOWS:

Mr. Richard L. Daff, Sr.
Chief, Traffic Operations Division
(410) 787-7630

Mr. Randall Scott
Asst. District Engineer - Traffic
(410) 321-2781

Mr. Joseph McMahon
Utility Engineer
(410) 321-2841

Mr. David J. Malkowski
District Engineer
(410) 321-2810


Mr. David Ramsey
Asst. District Engineer - Maintenance
(410) 321-2761

The Power Company Representative Is:

Mr. Tony Battista
Baltimore Gas and Electric Company
1068 North Front Street
Room 200
Baltimore, Maryland 21202
(410) 291-3118



REVISIONS	APPROVALS
	DESIGN SECTION
	ASST. DISTRICT ENGINEER, TRAFFIC
	CHIEF, TRAFFIC ENGINEERING DESIGN DIVISION
	DIRECTOR, TRAFFIC & SAFETY

	MARYLAND DOT - STATE HIGHWAY ADMINISTRATION <i>Office of Traffic & Safety</i> TRAFFIC ENGINEERING DESIGN DIVISION		
	MD 23 (EAST/WEST HWY.) AND US 1 BUSINESS (CONOWINGO RD.)		
DRAWN BY: NEM CHK. BY: <i>mm</i> MJW SCALE: 1" = 20' DATE: 3/99	F.A.P. NO. S.H.A. NO. COUNTY	AC-NH-G-123-1(30)E HA8735170 HARFORD	TS NO. 3857-GI SHEET NO. 198 OF 259